

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZHEJIANG CRYSTAL-OPTECH CO. LTD.,
Petitioner,

v.

VIAVI SOLUTIONS INC.,
Patent Owner.

IPR2022-01281
Patent 11,131,794 B2

Before DEBRA K. STEPHENS, JOHN A. HUDALLA, and
SHARON FENICK, *Administrative Patent Judges*.

FENICK, *Administrative Patent Judge*.

DECISION

Denying Institution of *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.4

I. INTRODUCTION

A. *Background and Summary*

Zhejiang Crystal-Optech Co. Ltd. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–3, 6–11, 13–17, and 19 (the “challenged claims”) of U.S. Patent No. 11,131,794 B2 (Ex. 1001, “the ’794 patent”). Paper 1 (“Pet.”). Viavi Solutions Inc. (“Patent Owner”), filed a

Preliminary Response. Paper 8 (“Prelim. Resp.”). With our authorization, Petitioner filed a reply to the Preliminary Response, addressing our discretion to deny under 35 U.S.C. § 314(a). Paper 9.

The Board has authority to determine whether to institute an *inter partes* review. See 35 U.S.C. § 314(b); 37 C.F.R. § 42.4(a). Under 35 U.S.C. § 314(a), we may not authorize an *inter partes* review unless the information in the Petition and the Preliminary Response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” For the reasons that follow, we do not institute an *inter partes* review as to the challenged claims of the ’794 patent.

B. Real Parties in Interest

Petitioner represents that it is the only real party in interest. Pet. 58. Patent Owner represents that it is the only real party in interest. Paper 6 (Patent Owner’s Mandatory Notices), 2.

C. Related Matters

Petitioner and Patent Owner identify *Viavi Solutions Inc. v. Zhejiang Crystal-Optech Co. Ltd.*, No. 2:21-cv-00378, pending in the Eastern District of Texas as related. Pet. 58; Paper 4, 2. Petitioner additionally identifies a case pending in the Northern District of California as related: *Viavi Solutions Inc. v. Platinum Optics Technology Inc.*, No. 5:20-cv-06655. Pet. 58.

Patent Owner identifies as related two *inter partes* review petitions that have been filed against patents “in the same patent family as the ’794 patent.” Paper 6, 2.

Petitioner additionally submits as relevant to its claim construction arguments a claim construction brief from an International Trade

Commission investigation and a declaration submitted by Patent Owner in PGR2019-00017. Pet. 15 (citing Ex. 1037 (Patent Owner’s opening brief on claim construction in ITC investigation 337-TA-1187) and Ex. 1039 (Declaration of Richard A. Flasck regarding U.S. Patent 9,989,684 B2).

D. The ’794 Patent

The ’526 patent, titled “Optical Filter and Sensor System,” relates to optical filters useful in sensor systems that detect movements or gestures based on near-infrared (NIR) light reflected from a user. Ex. 1001, code (54), 1:27–32. Figure 10, reproduced below, is a block diagram of a sensor system according to the ’794 patent.

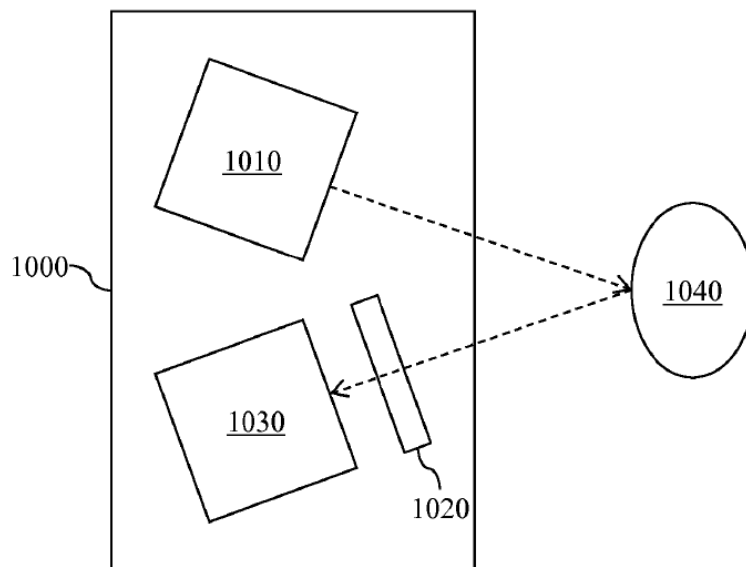


Figure 10 depicts sensor system 1000, which includes light source 1010 that emits NIR light toward target 1040. *Id.* at 9:48–51. Target 1040, in turn, reflects the emitted light toward sensor 1030. *Id.* at 9:59–61. Optical filter 1020 is disposed between the user and the sensor “to receive the emitted light after reflection by the target 1040.” *Id.* at 9:64–65, 10:5–8. The ’794 patent describes optical filter 1020 as a “narrow bandpass” filter because it transmits emitted light from light source 1010 in the NIR wavelength range

of 800 nm to 1100 nm, while “substantially blocking ambient light.” *Id.* at 1:33–41, 10:1–3.

Figure 6, reproduced below, illustrates a cross-section of the optical filter according to the '794 patent.

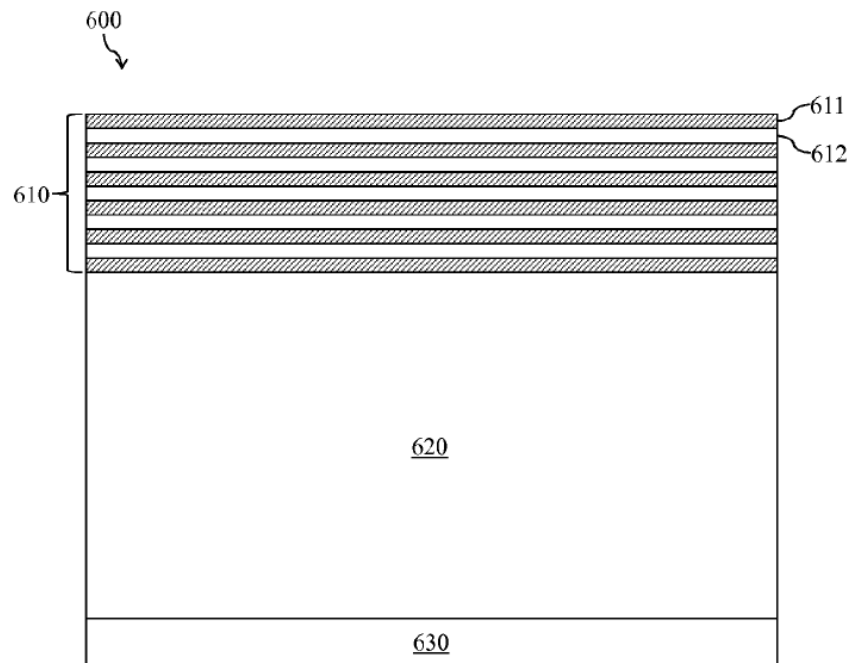


Figure 6 depicts an optical filter 600 that includes filter stack 610 disposed on substrate 620, such as a glass substrate. *Id.* at 5:64–6:1. Filter stack 610 “includes a plurality of hydrogenated silicon [Si:H] layers 611, which serve as higher-refractive-index layers, and a plurality of lower-refractive-index layers 612 stacked in alternation.” *Id.* at 6:9–12. “In most instances, the lower-refractive-index material is a dielectric material, typically, an oxide.” *Id.* at 7:4–5. The '526 patent lists “[s]uitable lower-refractive-index materials” as “silicon dioxide (SiO₂), aluminum oxide (Al₂O₃), titanium dioxide (TiO₂), niobium pentoxide (Nb₂O₅), tantalum pentoxide (Ta₂O₅), and mixtures thereof, i.e., mixed oxides.” *Id.* at 7:5–9.

The Si:H layers have a refractive index of greater than 3 over a wavelength range of 800 nm to 1100 nm, while the lower-refractive-index layers have a refractive index of less than 3 over the wavelength range of 800 nm to 1100 nm. *Id.* at 2:59–67. In a preferred embodiment, the Si:H layers have a refractive index of greater than 3.5 over the wavelength range of 800 nm to 1100 nm, for example “a refractive index of greater than 3.64, i.e., about 3.6, at a wavelength of 830 nm.” *Id.* at 6:30–35.

According to the ’794 patent, the disclosed optical filter improves over the prior art by minimizing the “center wavelength shift” in the filter’s optical response as the angle of incident light varies. *Id.* at 2:10–17, 24–27. Specifically, the claimed optical filter has a center wavelength shift of less than 20 nm in response to a 0° to 30° change in an incidence angle. *Id.* at 7:58–62. The ’794 patent states that a lower center wavelength shift allows for a “significantly narrower” passband that “improves the signal-to-noise ratio of systems incorporating the” claimed optical filters. *Id.* at 8:35–39. The optical filter is described as preferably having a blocking level, outside of the passband, of greater than OD2¹ between 400 nm to 1100 nm. *Id.* at 7:42–46.

E. Illustrative Claims

Petitioner challenges claims 1–3, 6–11, 13–17, and 19 of the ’794 patent. Pet. 1. Of the challenged claims, claims 1, 9, and 15 are independent. Claim 1, reproduced below, is illustrative of the subject matter recited in challenged claims 1–3 and 6–8.

¹ “OD2” refers to a blocking level of a specific optical density, i.e., one in which at most 1% of light can pass through. *See* Pet. 46 (citing Ex. 1002 ¶ 215).

1. An optical device, comprising:
 - a near infrared band pass filter, comprising:
 - a substrate having a first side and a second side;
 - a first set of layers on the first side, wherein the first set of layers includes silicon and hydrogen;
 - a second set of layers on the first side, wherein the second set of layers includes oxygen; and
 - a third set of layers on the second side, wherein the third set of layers includes oxygen.

Ex. 1001, 10:41–49.

Claim 9, reproduced below, is illustrative of the subject matter recited in challenged claims 9–11, 13, and 14.

9. An optical device, comprising:
 - a first set of layers including silicon and hydrogen; and
 - a second set of layers including oxygen;wherein the optical device is a near infrared bandpass filter that has a center wavelength that shifts by less than 15 nm in magnitude with a change in incidence angle from 0° to 30°.

Id. at 10:65–11:4.

Claim 15, reproduced below, is illustrative of the subject matter recited in challenged claims 15–17 and 19.

15. An optical system, comprising:
 - a light source for emitting light having a wavelength between 800–1100 nm; and
 - a filter comprising:
 - a first set of layers including silicon and hydrogen; and
 - a second set of layers including oxygen;

wherein the filter is designed for substantially allowing light in a wavelength range that includes the wavelength between 800-1100 nm to pass through it and exhibits a blocking level greater than OD2 between 400 nm to 1100 nm but outside of the wavelength range.

Id. at 11:17–12:5.

F. Evidence

Petitioner submits the following evidence:

Evidence	Exhibit No.
Declaration of Dr. Alan E. Wilner	1002
Pilgrim, US 2012/0224061 A1 (pub. Sept. 6, 2012, filed Feb. 28, 2012) (“Pilgrim”)	1004
Hidehiko Yoda et al., <i>a-Si:H/SiO₂ multilayer films fabricated by radio-frequency magnetron sputtering for optical filters</i> , APPLIED OPTICS 43(17):3548–54 (2004) (“Yoda”)	1005
Nahum, et al., US 7,088,441 B2 (iss. Aug. 8, 2006) (“Nahum”)	1006
Wallace et al., <i>Near-Infrared Bandpass Filters for Astronomy</i> , www.photonics.com/Articles/Near-Infrared_Bandpass_Filters_for_Astronomy/a43370 (August 2010) (“Wallace”)	1010
Gokturk et al., US 7,340,077 B2, issued March 4, 2008 (“Gokturk”)	1025
Alfred Thelen & Roland Langfeld, <i>Coating design contest: antireflection coating for lenses to be used with normal and infrared photographic film</i> , in <i>Thin Films for Optical Systems</i> , Karl H. Guenther, Ed., PROC. SPIE 1782:552–601 (1993) (“Thelen”)	1063
Terada, US 2007/0127126 A1 (pub. Jun. 7, 2007) (“Terada”)	1079

G. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C. §²	References
1, 2, 3, 6, 8	103	Pilgrim, Yoda, Thelen
1, 2, 3, 6, 8	103	Pilgrim, Yoda, Thelen
1, 2, 3, 6, 8	103	Pilgrim, Yoda, Terada
9, 10, 11, 13	103	Pilgrim, Yoda
14	103	Pilgrim, Yoda, Nahum
15, 16, 17	103	Pilgrim, Yoda, Wallace
7, 19	103	Pilgrim, Yoda, Wallace, Thelen
7	103	Pilgrim, Yoda, Thelen, Gokturk

Pet. 3–4. Patent Owner disputes Petitioner’s asserted grounds of unpatentability. *See generally* Prelim. Resp.

II. ANALYSIS

A. Discretionary Denial – 35 U.S.C. § 314(a)

Patent Owner argues that we should exercise discretion to deny institution under 35 U.S.C. § 314(a) because the factors identified in *Apple, Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”), weigh in favor of denying institution. Prelim. Resp. 43–47. Petitioner argues we should not discretionarily deny institution under *Fintiv*. Pet. 58–59; Paper 9.

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Petitioner uses the pre-AIA statutory framework in its analysis. Pet. 1 n.1. Patent Owner does not comment on this. The ’794 patent claims priority to a provisional filed before March 16, 2013, the effective date of the applicable AIA amendments. Thus, we refer to the pre-AIA version of 35 U.S.C. § 103. Our decision would be the same were we to apply the AIA version of the statute.

Because we determine Petitioner fails to establish a reasonable likelihood of prevailing in showing any of the claims challenged would have been obvious as discussed below, we do not reach this issue.

B. Legal Standards

“In an [inter partes review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring [inter partes] review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in inter partes review).

Furthermore, Petitioner must explain with particularity how the prior art would have rendered the challenged claims unpatentable. 35 U.S.C. § 312(a)(3); 37 C.F.R. § 42.104 (“The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon.”).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which said subject matter pertains. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences

between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations.³ *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

C. Level of Ordinary Skill in the Art

The level of skill in the art is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 1323–1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. at 17–18; *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

Petitioner argues that a person of ordinary skill in the art (“POSITA”) would have had:

a Bachelor’s degree or equivalent in physics, or in a related science or engineering field, along with at least 5 years of experience in optical element design and optical filters. Additional education (e.g., a Master’s degree with exposure to the above mentioned technologies) may substitute for some industrial experience in optical filter design, and more industrial experience can substitute for a different educational background.

Pet. 14; *see* Ex. 1002 ¶ 18.

Patent Owner does not oppose or comment on Petitioner’s definition of a POSITA. *See generally* Prelim. Resp. Based on the present record including the disclosure in the ’526 patent, we apply a slightly modified version of Petitioner’s definition of the level of ordinary skill in the art that removes the qualification of “at least” and clarifies some statements. More specifically, we determine a POSITA would have had a Bachelor’s degree or equivalent in physics, or in a related science or engineering field, along with

³ In the present record, neither party presents arguments or evidence relating to secondary considerations.

five years of experience in optical element design and optical filters although additional education (e.g., a Master's degree with exposure to optical element design and optical filters) may substitute for some industrial experience in optical element and optical filter design, and more industrial experience can substitute for a different educational background.

We determine this level of skill comports with the qualifications a person would have needed to understand and implement the teachings of the '794 patent and the prior art of record. *Cf. Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself may reflect an appropriate level of skill in the art).

D. Claim Construction

We construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc), i.e., as construed in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b) (2020). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Phillips*, 415 F.3d at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Phillips*, 415 F.3d at 1313. An inventor may rebut that presumption by providing a definition of the term in the specification “with reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a

definition, limitations are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Petitioner asserts the term “center wavelength” (recited in claims 8, 9, and 17) should be interpreted as “the average of the two half-power wavelengths (i.e., [full width half maximum]) in a passband.” Pet. 15 (citing Ex. 1001, 7:53–56, 9:1–4, FIGS. 7D, 8C, 9B; Ex. 1037, 5; Ex. 1039 ¶ 47).

Petitioner asserts the term “passband” (recited in claim 14) should be interpreted as “a wavelength range within which a signal can pass through a filter and outside of which the signal is blocked,” as per Patent Owner’s construction *Id.* (citing Ex. 1037, 12–15).

Patent Owner does not directly address Petitioner’s proposed interpretations or provide its own constructions for any claim term. *See generally* Prelim. Resp.

Having considered the record, we conclude that no express claim construction is necessary for any claim terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (holding that only claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

E. Claims 1, 2, 3, 6, and 8 – Obviousness over Pilgrim, Yoda, and Thelen

Petitioner argues that claims 1–3, 6, and 8 would have been obvious in view of a combination of Pilgrim, Yoda, and Thelen. Pet. 15–28. Petitioner additionally relies Tsai-133⁴ as showing the knowledge of one of ordinary

⁴ Tsai et al., U.S. Patent No. 5,398,133 (iss. Mar. 14, 1995) (“Tsai-133”)

skill in the art. *Id.* at 18–19. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 19–38.

1. Pilgrim

Pilgrim relates to “[a] method and device for viewing objects situated in fog.” Ex. 1004, code (57). “An optical system directs light from a scene onto a detector array through one or more optical waveband limiting filters.” *Id.* According to Pilgrim, “[t]he pass band of the filter(s) reduces the amount of light scattered from the droplets of fog shifting the effective dynamic range of the lightest to the darkest portions of the image so that the detectors can provide detectible contrast between the objects being viewed compared with the background.” *Id.* ¶ 13. “Multilayer bandpass filters are comprised of alternating layers of high and low refractive index materials” and the “number and thickness of these layers are selected to determine the wavelength of the pass band and the bandwidth.” *Id.* ¶ 26.

Pilgrim teaches that, “[i]n the preferred embodiments, one or more bandpass filters are used to block all wavelengths of light except for those corresponding to the absorption bands of water.” *Id.* ¶ 15. Moreover, “[i]n particular embodiments the filters can be comprised of multilayer coatings applied to flat optical surfaces.” *Id.* ¶ 16. Pilgrim further teaches that, when using multilayer bandpass filters, the “band limits are chosen to ensure the shift in the pass band due to changes in the angle of incidence (AOI) does not result in the pass band being shifted out of the absorption band for which it is designed.” *Id.*

Figure 3A of Pilgrim, reproduced below, illustrates the range of angles of incident of light passing through multilayer passband filter 300.

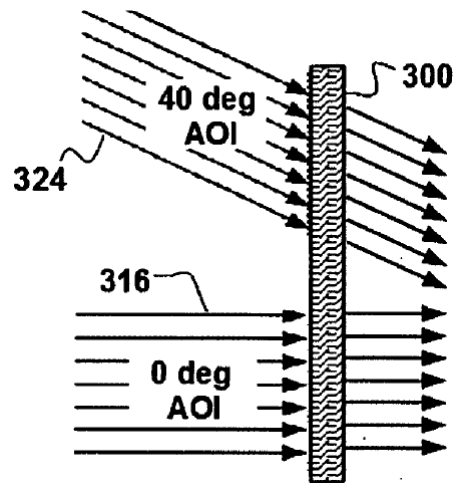


Figure 3A illustrates a multilayer bandpass filter with light passing through it normal to the surface of the filter and at an AOI of 40 degrees off of normal. *Id.* ¶ 6. Pilgrim teaches that “when incident light has an angle of incidence (AOI) of 0 (zero) degrees [shown in element] 316[,] the pass band is at its longest wavelength.” *Id.* ¶ 25. And incident light having an “AOI of 40 degrees [element] 324, is at the limit of the field-of-view of a preferred embodiment.” *Id.* Figure 3B, reproduced below, shows the “spectral effects of changes in the [AOI] of incoming light.” *Id.* ¶ 26.

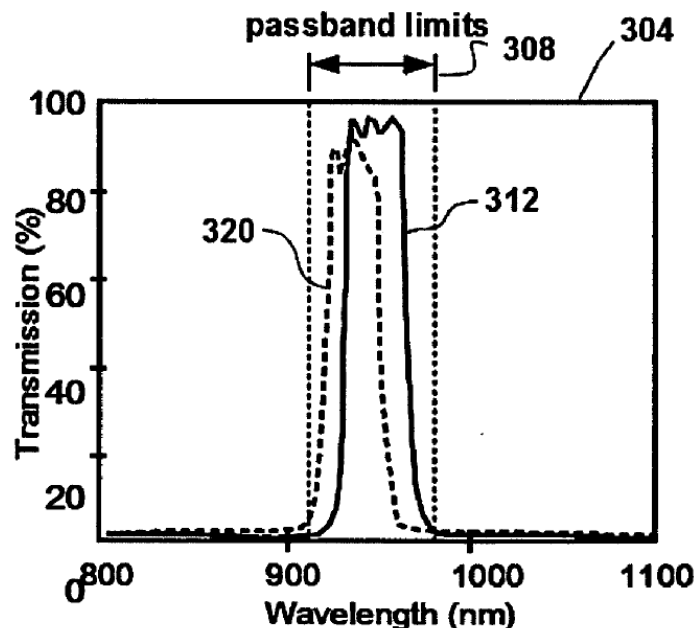


Figure 3B is a spectrogram showing spectral effects of changes in the light's incidence angle for an example in which the passband is centered on 950 nm with a full bandwidth of about ± 25 nm. *Id.* ¶ 26. “The pass band for 0 degree AOI light 312 is designed to be far enough from the edges of the absorption pass band limits 308 that the shift in pass band at the widest AOI for the application (such as 40 degrees) 320 remains inside the pass band limits.” *Id.* Here, Pilgrim states, “[t]he shift in pass band center between an AOI of 0 degrees and an AOI of 40 degrees is approximately 15 nm.” *Id.*

2. Yoda

Yoda relates to the optical properties of bandpass filters comprising “*a*-Si:H/SiO₂ multilayer films fabricated by radio-frequency magnetron sputtering.” Ex. 1005, 3548.⁵ Yoda explains “optical bandpass filters (BPFs)” are “formed from alternating multilayer films of two dielectric materials . . . with high-low refractive indices.” *Id.* at 3548.

According to Yoda, a bandpass filter pairing materials having a “high refractive-index contrast, which is defined as the high index of one material divided by the low index of another,” allows for a reduction in the total number of layers of a multilayer optical filter. *Id.* Yoda teaches that “[t]wo such pairs of materials are hydrogenated amorphous silicon (*a*-Si:H) and silicon dioxide (SiO₂).” *Id.* Yoda teaches that “*a*-Si:H/SiO₂ multilayer films have the major advantage that the total number of layers of the multilayer is almost half of that of Ta₂O₅/SiO₂ multilayer films.” *Id.*

⁵ For clarity, we refer to the original pagination of Yoda rather than the page numbers added to Exhibit 1005.

Figure 7 of Yoda, reproduced below, shows an optical BPF having hydrogenated amorphous silicon (α -Si:H)/silicon dioxide (SiO_2) alternating multilayers. *Id.* at 3548, 3551.

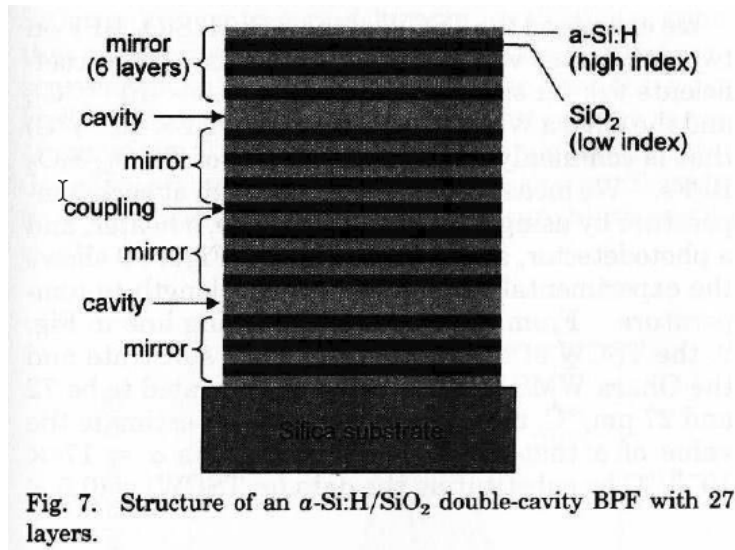


Figure 7 shows an optical BPF having hydrogenated amorphous silicon (α -Si:H)/silicon dioxide (SiO_2) alternating multilayers. *Id.*

Figure 8 of Yoda is reproduced below.

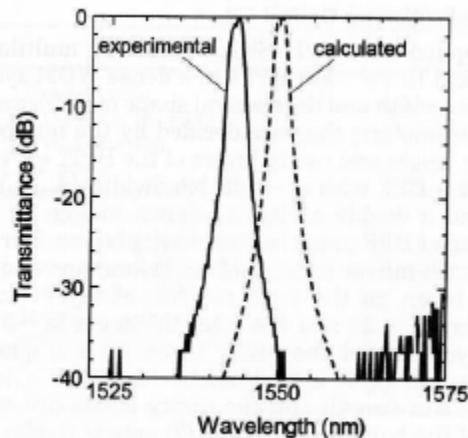


Figure 8 illustrates “experimental and calculated transmission spectra of the *a*-Si-H/SiO₂ [BandPass Filter] fabricated by use of the optical monitoring system.” *Id.* at 3552.

Figure 4 of Yoda is reproduced below.

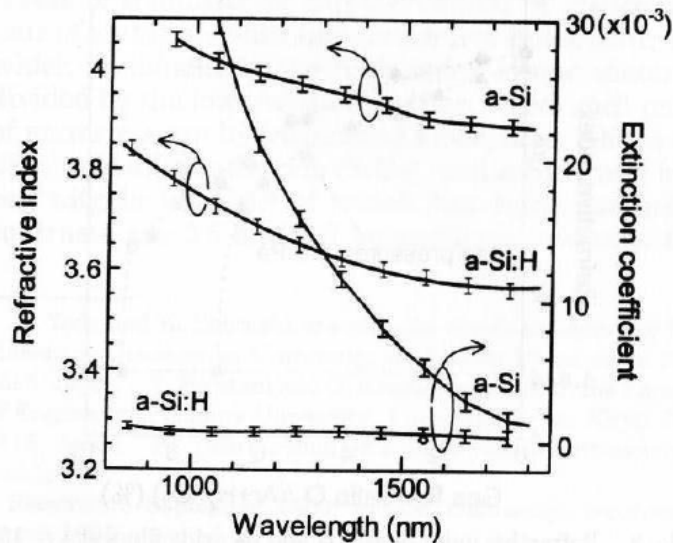


Fig. 4. Refractive index and extinction coefficient of *a*-Si:H and Si:H as functions of wavelength.

Figure 4 of Yoda, reproduced above, “shows the *a*-Si:H refractive index (*n*) and extinction coefficient (*k*) with error bars as a function of wavelength.” *Id.* at 3550. For example, as shown in Figure 4, “the *α*-Si:H refractive index at $\lambda = 1550$ nm is estimated to be $n = 3.59 \pm 0.015$,” and the extinction coefficient “is estimated to be approximately $k < 1 \times 10^{-4}$.”

3. Thelen

Thelen relates to the results of a design contest for “[a]ntireflection coating for lenses to be used with normal and infrared photographic film.” Ex. 1063, 552.⁶ Two categories of responses were permitted: “conventional design” and “futuristic design.” *Id.* For the former category, “[a]ll layers

⁶ For clarity, we refer to the original pagination of Thelen rather than the page numbers added to Exhibit 1063.

[were] homogeneous.” *Id.* For the latter category, “[m]ixtures of oxide materials (not with MgF_2) [were] permitted, both as homogenous layers with inbetween [sic] refractive indices and/or tranition [sic] layers.” *Id.* Coating materials could include MgF_2 , SiO_2 , Al_2O_3 , Ta_2O_5 , and TiO_2 . *Id.* at 553. The goal of the design competition was to have the lowest figure of “Merit F,” where Merit F was defined by a specific formula. *Id.* at 552–53.

Thelen reports that “[t]here were 44 designs contributed by 28 authors.” *Id.* at 555.

4. Tsai-133

Tsai-133 relates to a NIR optical filter comprised of alternative layers of “low refractive index amorphous silicon nitride and high refractive index amorphous silicon.” Ex. 1008, code (57). One such filter includes an anti-reflection coating, as seen in Figure 7, reproduced below.

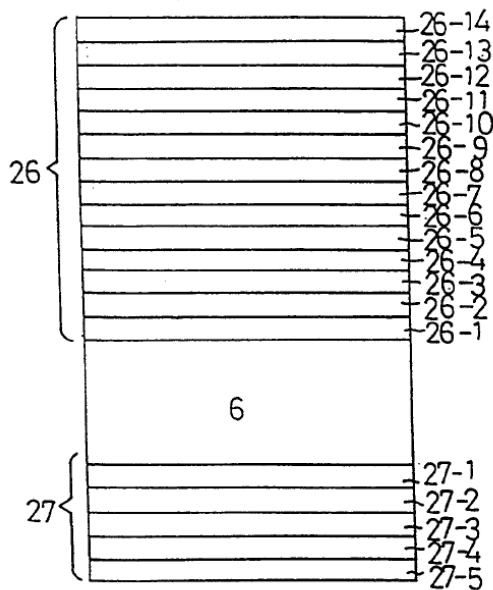


FIG.7

Figure 7 shows the cross-section of a substrate with a 14-layer edge filter on one side and a five-layer anti-reflection coating on the other. *Id.* at 2:34–35,

2:40–42. Tsai-133 notes that this coating is applied “for the improvement of transmittance in the near-infrared signals and the avoidance of loss due to reflection at the uncoated side of the substrate.” *Id.* at 4:60–62.

5. *Claim 1*

a) Petitioner’s Arguments

Petitioner argues that the subject matter of claim 1 would have been obvious in view of a combination of Pilgrim, Yoda, and Thelen. Pet. 15–26. In particular, Petitioner argues that each of Pilgrim and Yoda describes an optical filter, teaching the device of the preamble. *Id.* at 15–16 (citing Ex. 1004, code (57), ¶¶ 15, 21; Ex. 1005, 3548; Ex. 1002 ¶¶ 114–116).

With respect to the near infrared band pass filter, Petitioner argues that Pilgrim and Yoda each relate to near infrared (NIR) optical filters. *Id.* at 16 (citing Ex. 1004 ¶¶ 13–16, 26; Ex. 1005, 3548; Ex. 1002 ¶¶ 117–118).

For the first and second set of layers and the substrate, Petitioner cites Pilgrim’s disclosure of multilayer bandpass filters comprised of alternating layers of high and low refractive index materials, and Yoda’s filter that includes a substrate with a first and second side, and in which the substrate has disposed on its upper side a set of layers composed alternately of hydrogenated silicon and SiO₂. Pet. 16–18 (citing Ex. 1004, ¶ 26; Ex. 1005, 3548, 3550, 3551, Figs. 6, 7; Ex. 1002 ¶¶ 119, 201–204).

Lastly, with respect to the requirement that there be a third set of layers including oxygen on the second side of the substrate, Petitioner argues that one of ordinary skill in the art would have recognized that the other side of the Yoda substrate would have been “available” for the deposition of an anti-reflection (AR) coating, as shown in Tsai-133. *Id.* at 18–19 (citing Ex. 1008, 4:64–5:14; Ex. 1002 ¶¶ 124–126). This AR coating, Petitioner

argues, would have been understood to be made up of layers of alternating high and low index materials, which would have included oxides, as discussed in Thelen. *Id.* at 19 (citing Ex. 1063, 552–53, 555, 580, 591, 599–600; Ex. 1002 ¶¶ 124–126).

With respect to the propriety of its proposed combination, Petitioner argues that one of ordinary skill in the art would have combined Pilgrim, Yoda, and Thelen. Pet. 19–26. Petitioner notes that Pilgrim describes the use of a multi-layer interference filter comprised of alternating layers of high and low refractive index materials. *Id.* at 20 (citing Ex. 1004 ¶¶ 15, 16, 21, 26, 3B). Petitioner additionally highlights that Pilgrim describes that the passband of a filter could be centered at 950 nm with a range from 925–975 nm, that the filter would have a small center wavelength shift, that light outside the passband limits should be blocked, and that the filter would be designed for wavelengths ranging from 800 nm to 1100 nm. *Id.* at 20–22 (citing Ex. 1004 ¶¶ 22, 25–26, Figs. 2, 3B; Ex. 1002 ¶¶ 127–144, 223).

Petitioner acknowledges that while Pilgrim provides design parameters for an interference filter, it does not describe the specific design or materials for the filter. *Id.* at 22 (citing Ex. 1002 ¶¶ 127–144). However, Petitioner argues, one of ordinary skill would have found it obvious to choose hydrogenated silicon for the high refractive index layers. *Id.* at 22–23 (citing Ex. 1002 ¶¶ 127–144; Ex. 1007, 327, 330; Ex. 1008, 1:55–67, 5:68, Ex. 1035, 184). Additionally, Petitioner argues that Yoda teaches such hydrogenated silicon layers with a refractive index greater than 3.65 at a wavelength of 830 nm. *Id.* at 22–23 (citing Ex. 1005, 3548; Ex. 1002 ¶¶ 127–144).

Petitioner further argues that Yoda’s disclosures would have made it obvious to one of ordinary skill in the art to use silicon dioxide or silicon nitride as the lower refractive index layers of a filter. *Id.* at 24–25 (citing Ex. 1005, 3548; Ex. 1002 ¶¶ 127–144). Each of these teachings from Yoda, Petitioner argues, would have allowed for a “relatively high refractive index contrast” and fewer layers. *Id.* (citing Ex. 1005, 3548). Thus, Petitioner argues, “the claimed Si:H high refractive index layers and optical properties of the filter layers as recited in claim 1 to be obvious material characteristics that were routinely optimized parameters disclosed in the prior art as being result-effective in the performance of optical interference filters.” *Id.* at 25 (citing Ex. 1002 ¶¶ 127–144).

Additionally, Petitioner argues that one of ordinary skill in the art would have expected success “in optimizing the parameters and designing a filter for Pilgrim’s application and to meet Pilgrim’s design goals in light of the guidance about how various processes and parameters impacted the index of refraction and extinction coefficient of Si:H and the POSITA’s ability to simulate the performance of the filter designs using the optimized materials.” *Id.* (citing Ex. 1002 ¶¶ 144–155).

Petitioner further argues that one of ordinary skill in the art would have used oxygen-based materials on the second side of the substrate to create an AR coating, and “was familiar with a variety of techniques for forming alternating layers of high- and low- refractive index oxides and would have expected success in forming such layers on substrates to form an AR coating.” *Id.* at 25–26 (citing Ex. 1063, 552–53, 558–59, 599–600; Ex. 1002 ¶¶ 213–218).

b) Patent Owner's Arguments

Patent Owner argues that Pilgrim discloses a design need for an optical filter with specific requirements. Prelim. Resp. 19–20 (citing Ex. 1004 ¶ 26, Fig. 3B). However, according to Patent Owner, Pilgrim does not disclose a multilayer bandpass filter meeting its design requirements. *Id.* at 20. And, Patent Owner continues, Pilgrim provides no starting point for a filter meeting these requirements and does not mention hydrogenated silicon or any material containing oxygen. *Id.* at 20–21. Patent Owner argues:

Pilgrim itself does not provide a disclosure that a POS[IT]A could have used to obtain a bandpass filter meeting the limitations of the article recited in claim 1 of the '794 patent. Therefore, Petitioner's combination with Yoda and Thelen cannot support any unpatentability argument unless these references could have been used by a POS[IT]A to achieve the necessary design.

Id. at 21.

Turning to Yoda's teachings and the combination, Patent Owner argues that Yoda would have provided only an invitation for further research, and not a filter meeting Pilgrim's design requirements. *Id.* at 23–26. Patent Owner contends that Yoda's filter is a bandpass filter operating above 1530 nm, while Pilgrim specifies a 950 nm center wavelength. *Id.* at 10, 19, 24–25 (citing Ex. 1004, ¶ 10, Figs. 2, 8; Ex. 1005, Fig. 8). Patent Owner further argues that this passband is “well outside any of the other absorption bands of water that are illustrated by Pilgrim.” *Id.* Additionally, Patent Owner argues, Yoda does not consider what the center wavelength shift might be for changed AOIs, and thus can not show Pilgrim's design requirement for a center wavelength shift of less than 15 nm over a change

in AOI from 0°–40°. *Id.* at 25–26. Thus, Patent Owner argues, Yoda’s filter does not meet Pilgrim’s design parameters.

Patent Owner argues that, even if Yoda’s filter were appropriate for Pilgrim, one of ordinary skill would have been required “to undertake the substantial design of a new multilayer optical filter consisting of thin films of hydrogenated silicon and a lower refractive index material.” *Id.* at 33–35. Additionally, Patent Owner argues that Petitioner has not shown a nexus between the optimization of the material characteristics of Yoda’s filter for performance and the design of a filter meeting Pilgrim’s specifications. *Id.* at 36.

Lastly, Patent Owner argues that “there would be no reason” for a person of ordinary skill in the art to have added an AR coating to an optical filter in order to meet Pilgrim’s design parameters. Prelim. Resp. 38.

c) Analysis and Conclusion

We agree with Patent Owner that Petitioner fails to show a reasonable likelihood that the claimed invention would have been obvious over the combination of Pilgrim, Yoda, and Thelen.

Petitioner has shown that Pilgrim teaches the desirability of an optical filter stack having specific properties, and that Yoda teaches an optical filter having the claimed first side layers. Petitioner also has described an AR coating in Thelen including oxygen. However, even so, Petitioner does not show that the claimed invention as a whole would have been obvious. With respect to the combination of Yoda and Pilgrim, even if it would have been desirable to use Yoda’s filter layers and assuming those layers would have had the claimed filter layer properties, as Petitioner asserts, Petitioner fails to show that an ordinarily skilled artisan would have obtained Pilgrim’s cited

filter properties for an optical filter stack when implementing Yoda's filter layers in Pilgrim's optical filter stack.

The optical filter that Pilgrim discloses, and that Petitioner relies on to teach the claimed optical filter properties, has a passband that "is centered on 950 nm with a full bandwidth of approximately +/-25 nm" and a "shift in [passband] center between an [angle of incidence (AOI)] of 0 degrees and an AOI of 40 degrees [that] is approximately 15 nm." Ex. 1004 ¶ 26. Yoda is silent with regard to whether its filter layers could be used in an optical filter having a limited shift at a passband center, as disclosed by Pilgrim. As Patent Owner points out, "no reference cited [in] the Petition describes a design for *any* optical filter with a center wavelength shift of 15 nm over the 0° to 40° AOI range." Prelim. Resp. 3. And Yoda does not "consider how the center wavelength would shift based on AOI." *Id.* at 25.

Petitioner's assertion that optical filter properties and the filter layer properties are "routinely optimized parameters" does not adequately explain that an ordinarily skilled artisan would have implemented the filter layer properties taught by Yoda in an optical filter to obtain the properties disclosed by Pilgrim and/or required by the claims. Still further, Petitioner's assertion about routine optimization is conclusory and is not supported by evidence. Nor is Petitioner's argument that one of ordinary skill in the art would have had a reasonable expectation of success in "optimizing parameters" to design a filter for Pilgrim's application supported by adequate evidence.

Petitioner must show not only "that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention," but also "that the skilled artisan would have had a

reasonable expectation of success in doing so.” *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.* 688 F.3d 1342, 1360 (Fed. Cir. 2012).

Petitioner’s assertion that a

POSITA would have expected to succeed in optimizing the parameters and designing a filter for Pilgrim’s application and to meet Pilgrim’s design goals in light of the guidance about how various processes and parameters impacted the index of refraction and extinction coefficient of Si:H and the POSITA’s ability to simulate the performance of the filter designs using the optimized materials.

(Pet. 25) does not address whether a POSITA would have had a reasonable expectation of success in creating an optical filter with the required properties using the filter layers described by Yoda. Petitioner has not shown a POSITA would have had the “ability to simulate the performance of the filter designs using the optimized materials.” Pet. 25. For example, Petitioner has not discussed what specific simulation techniques or tools would have been used by a POSITA. Furthermore, although Petitioner’s expert asserts

the POSITA would have been led to select hydrogenated silicon as the high-refractive index material and would have further found it obvious to design the material to increase the refractive index to meet the design goals, while still maintaining a low extinction coefficient. These goals would have been achieved by tailoring the deposition processes and conditions, as well as the hydrogen content of the hydrogenated silicon material, as was known to the POSITA

(Ex. 1002 ¶ 129), that statement does not explain how tailoring the deposition processes and conditions and the hydrogen content would have led to successfully maintaining the low extinction coefficient, let alone to successfully creating an optical filter with the required passband

characteristics. Rather, as Patent Owner points out, the evidence cited in the record before us suggests “the design of [an optical] bandpass interference filter with a narrow bandwidth and low center wavelength shift is not trivial.” Prelim. Resp. 34 (citing Ex. 1001, Fig. 7C). Specifically, in detailing the requisite filter layers for an exemplary filter, the ’794 patent describes a filter stack of 48 layers of materials having varying thicknesses, an “[antireflective] coating includ[ing] 5 layers, and the total coating thickness [being] about 5.7 μm .” Ex. 1001, 8:4–15, Figs. 7B–7C.

Additionally, we note Petitioner’s argument that one of ordinary skill “would have expected success in forming such layers on substrates to form an AR coating” (Pet. 26) does not address whether one of ordinary skill in the art would have expected the resulting optical filter to meet the design parameters of Pilgrim, including any effect caused by the use of an AR coating.

Accordingly, upon our review of Petitioner’s contentions, we determine Petitioner fails to make a sufficient showing that the combination of Pilgrim, Yoda, and Thelen would have rendered claim 1 obvious.

6. Claims 2, 3, 6, and 8

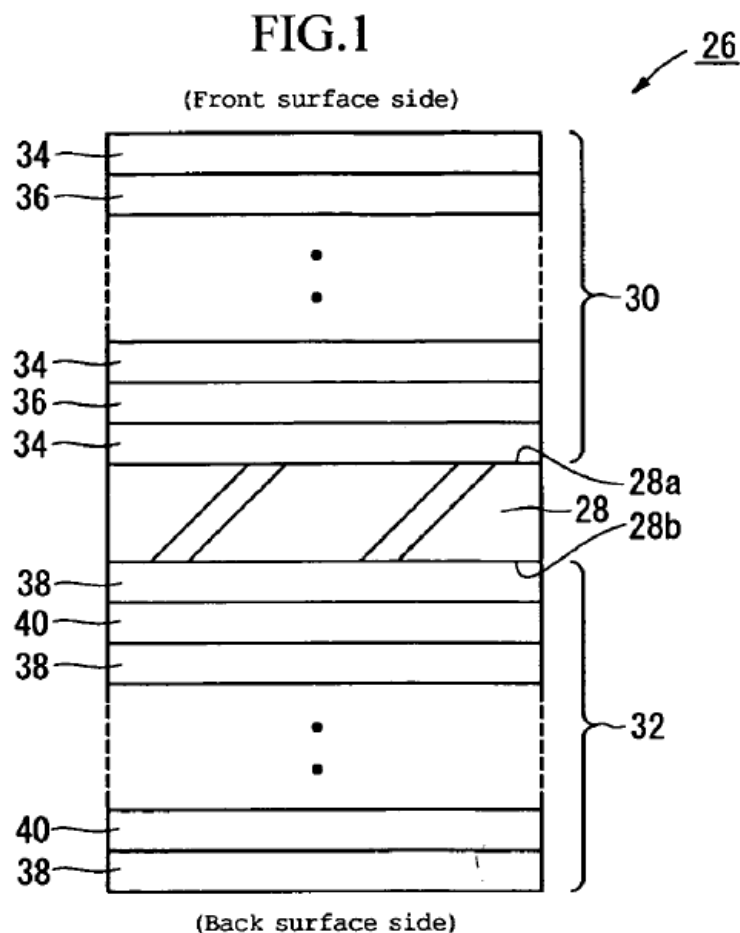
Petitioner’s arguments on claims 2, 3, 6, and 8 reference and rely on the same arguments as claim 1. Pet. 26–28. Accordingly, for the same reasons discussed above, Petitioner fails to make a sufficient showing that the combination of Pilgrim, Yoda, and Thelen would have rendered claims 2, 3, 6, and 8 obvious.

F. Claims 1, 2, 3, 6, and 8 – Obviousness over Pilgrim, Yoda, and Terada

Petitioner argues that claims 1–3, 6, and 8 would have been obvious in view of a combination of Pilgrim, Yoda, and Terada. Pet. 28–34. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 39–42.

1. Terada

Terada relates to a “dielectric multilayer filter.” Ex. 1079, codes (54), (57). Terada’s Figure 1 is reproduced below:



Terada’s Figure 1 is a schematic diagram of a dielectric multilayer filter, with front and back surfaces of a substrate covered by layers of film. *Id.* ¶¶ 29, 65. Terada discloses transparent substrate 28 has front surface 28a and back surface 28b. *Id.* ¶ 65. Dielectric multilayer film 30, deposited on

front surface 28a of substrate 28 is composed of layers of two materials, layers 34 and layers 36, alternately stacked. *Id.* Similarly, dielectric multilayer film 32, deposited on back surface 28b of substrate 28 is composed of layers of two materials, layers 38 and layers 40, alternately stacked. *Id.* ¶¶ 65–66. Different dielectric materials are discussed as included among these films. *Id.* ¶¶ 26, 68, claim 5.

2. Claim 1

Petitioner reiterates its contentions with respect to Pilgrim and Yoda’s teachings for each limitation of claim 1 save the last limitation. Pet. 28–31. Petitioner additionally notes Terada’s teachings with respect to these limitations, describing Terada as teaching each element except for the first set of layers including silicon and hydrogen. *Id.* (citing Ex. 1079, code (57), ¶¶ 5, 26, 65, 85, claim 5, Fig. 1; Ex. 1002 ¶¶ 158–167).

With respect to the last limitation, Petitioner argues that Terada teaches or suggests this limitation. *Id.* at 31–32. Petitioner highlights that Terada teaches a filter that includes stacked alternating layers on each side of a substrate, and provides oxide possibilities for one such stack. *Id.* (citing Ex. 1079 ¶¶ 26, 66, 68, claim 5; Ex. 1002 ¶ 168). Petitioner argues that one of ordinary skill would have used Terada’s teachings to create an AR coating on a Yoda device. *Id.* at 33–34 (citing Ex. 1002 ¶¶ 169–172).

Patent Owner argues that Terada does not disclose either film stack as being an AR coating, or either stack having separate utility. Prelim. Resp. 39–40 (citing Ex. 1079 ¶¶ 23–26, 65). Additionally, Patent Owner contends that Terada’s embodiments with an AR coating do not provide any design or material information for an AR coating. *Id.* at 41. Patent Owner further

contends that Petitioner does not properly provide a motivation for the use of an AR coating to meet Pilgrim's design parameters. *Id.*

With respect to the combination of Pilgrim and Yoda, we refer to our prior determination that Petitioner has not demonstrated a reasonable likelihood of success in showing that one of ordinary skill in the art would have had a reasonable expectation of success in using Yoda's teachings to design a filter for Pilgrim's application. Additionally, we agree with Patent Owner that the record does not make clear why one of ordinary skill in the art would have added an AR coating to meet Pilgrim's design parameters or what the effect of the combination including the teachings of Terada would have been to the performance of a filter as taught or suggested by Yoda, with respect to those design parameters.

Accordingly, upon our review of Petitioner's contentions, we determine Petitioner fails to make a sufficient showing that the combination of Pilgrim, Yoda, and Terada would have rendered claim 1 obvious.

3. Claims 2, 3, 6, and 8

Petitioner's arguments on claims 2, 3, 6, and 8 reference and rely on the same arguments as claim 1. Pet. 34–35. Accordingly, for the same reasons discussed above, Petitioner fails to make a sufficient showing that the combination of Pilgrim, Yoda, and Terada would have rendered claims 2, 3, 6, and 8 obvious.

G. Claims 9–11 and 13 – Obviousness over Pilgrim and Yoda

Petitioner argues that claims 9–11 and 13 would have been obvious in view of a combination of Pilgrim and Yoda. Pet. 27–28, 35–37. Patent Owner disputes Petitioner's contentions. Prelim. Resp. 42.

1. Claim 9

For claim 9, Petitioner reiterates certain of its arguments with respect to Pilgrim and Yoda's teachings from claim 1. Pet. 35–36. As to the last limitation, relating to the optical device having a center wavelength that shifts by less than 15 nm in magnitude with a change in AOI from 0° to 30°, Petitioner argues that this requirement is specified in Pilgrim's requirement of shifting 15 nm from an AOI from 0° to 40°. Pet. 27–28 (citing Ex. 1004 ¶¶ 25–26; Ex. 1002 ¶¶ 151–154).

Patent Owner reiterates its prior arguments. Prelim. Resp. 42.

We refer to our prior determination that Petitioner has not demonstrated a reasonable likelihood of success in showing that one of ordinary skill in the art would have had a reasonable expectation of success in using Yoda's teachings to design a filter for Pilgrim's application. Petitioner relies on Pilgrim for teaching a center wavelength shift of approximately 15 nm from an AOI from 0° to 30°. Pet. 27–28. But Pilgrim's description of a center wavelength shifting approximately 15 nm from an AOI from 0° to 40° is a design requirement of Pilgrim, and Pilgrim does not describe how to achieve it. *See* Pet. 22 (“Pilgrim provides certain design parameters for an interference filter—e.g., its center wavelength, FWHM, and center wavelength shift—Pilgrim does not describe the specific design or materials for the filter.”) Petitioner does not explain how an ordinarily skilled artisan would have achieved such a center wavelength shift in a combination with Yoda based on Pilgrim's teachings. Thus, we find that Petitioner's citation to Pilgrim for a design parameter is insufficient to establish that one of ordinary skill in the art, given the teachings of the cited prior art, would have designed a filter meeting that parameter.

Accordingly, upon our review of Petitioner's contentions, we determine Petitioner fails to make a sufficient showing that the combination of Pilgrim and Yoda would have rendered claim 9 obvious.

2. Claims 10, 11, and 13

Petitioner's arguments on claims 10, 11, and 13 reference and rely on the same arguments as claim 1. Pet. 36–37. Accordingly, for the same reasons discussed above, Petitioner fails to make a sufficient showing that the combination of Pilgrim and Yoda would have rendered claims 10, 11, and 13 obvious.

H. Claim 14 – Obviousness over Pilgrim, Yoda, and Nahum

Petitioner argues that claim 14 would have been obvious in view of a combination of Pilgrim, Yoda, and Nahum. Pet. 38–43. Patent Owner disputes Petitioner's contentions. Prelim. Resp. 39.

1. Nahum

Nahum relates to measurement of a wavelength related characteristic of a radiation source. Ex. 1006, code (57). Nahum discloses filters with higher and lower refractive index layers. *Id.* at Fig. 10B. These filters are placed in the travel path of light beams to provide different filter results for light entered with different angles of incidence. *Id.* at code (57).

Nahum teaches that its filters can be “dielectric Fabrey-Perot” filters, and that such filters “can provide a desired dependence of the filter characteristic on the angle of incidence θ of the input beam relative to the direction normal to the filter surface.” *Id.* at 6:59–64. Nahum provides an expression that shows the peak central wavelength at an angle of incidence, given the peak central wavelength at normal incidence, the refractive index

of the external medium, the effective refractive index N^* of the filter, and the angle of incidence. *Id.* at 6:64–7:12.

2. Claim 14

Claim 14 depends from claim 9 and further requires that “the passband shifts by less than 13 nm in magnitude with a change in an incidence angle from 0° to 30° .” Ex. 1001, 11:14–16. For this claim limitation, Petitioner argues that Nahum teaches an optical filter meeting the passband requirements. Pet. 38–43. Petitioner also argues that Nahum’s equation shows that the refractive index of the high index (Si:H) layer of Yoda would yield a shift of center wavelength of less than 13 nm at all wavelengths between 800 nm and 1100 nm, for a change in the angle of incidence of 0° to 30° . *Id.* (citing Ex. 1005, 3550; Ex. 1006, 7:1–5; Ex. 1002 ¶¶ 195–207). Petitioner further argues that a filter’s effective refractive index would be close to the refractive index of the high-index layer if there are increasing layers in the filter. *Id.* at 42 (citing Ex. 1005, 262–265). Thus, concludes Petitioner, one of ordinary skill would have found that the teachings of Yoda would have resulted in the claimed quality of the optical filter. *Id.* at 42 (citing Ex. 1002 ¶¶ 195–207).

As before, we determine that Petitioner has not demonstrated a reasonable likelihood of success in showing that one of ordinary skill in the art would have had a reasonable expectation of success in using Yoda’s teachings to design a filter for Pilgrim’s application. In addition, Petitioner does not clearly explain what the composition and design could be for a filter using hydrogenated silicon as the high index material. Petitioner describes adding more alternating layers in order to bring the effective refractive index of a filter closer to that of its high-index (Si:H) layers.

Pet. 42. However, Petitioner does not adequately show that this technique would result in a filter suitable for achieving the design requirements of Pilgrim. *See* Pet. 12 (citing Ex. 1005, 3548, 3551) (selecting Si:H to reduce filter stack thickness or allow designs with the “major advantage” of fewer total layers). Additionally, Nahum’s equation is described as “valid in at least one embodiment for θ from 0° to 20° ,” but is used in the Petition to calculate center wavelength shifts for an angle of incidence of 30° without further explanation. Ex. 1006, 6:64–7:13; Pet. 39–40.

Accordingly, upon our review of Petitioner’s contentions, we determine Petitioner fails to make a sufficient showing that the combination of Pilgrim, Yoda, and Nahum would have rendered claim 14 obvious.

I. Claims 15–17 – Obviousness over Pilgrim, Yoda, and Wallace

Petitioner argues that claims 15–17 would have been obvious in view of Pilgrim, Yoda, and Wallace. Pet. 43–52. Petitioner cites its earlier arguments with respect to claim 1 for the limitations regarding “the specifics of the filter including the use of Si:H and oxygen” and the obviousness of those over the combination of Pilgrim and Yoda. *Id.* at 44.

For the limitation requiring that “the filter is designed for substantially allowing light in a wavelength range that includes the wavelength between 800-1100 nm to pass through it and exhibits a blocking level greater than OD2 between 400 nm to 1100 nm but outside of the wavelength range” (Ex. 1001, 12:1–5), Petitioner argues that Pilgrim teaches “allowing light in” in the specified wavelength range. *Id.* at 44–45 (citing Ex. 1004 ¶¶ 26, Fig. 3B; Ex. 1002 ¶¶ 214–221). Petitioner additionally argues that Pilgrim teaches blocking wavelengths outside of the passband, but not the specified blocking level. *Id.* at 45–47 (citing Ex. 1004 ¶¶ 15, 26, Fig. 2, 3B; Ex. 1002

¶¶ 29, 214–221). Consequently, Petitioner argues that it would have been obvious to design a filter providing Pilgrim’s desired features. *Id.* at 49–50.

Patent Owner argues that, in addition to issues with the combination of Pilgrim and Yoda, “Petitioner does not explain how to use Wallace in combination with Yoda to achieve all of the requirements of Pilgrim’s filter.” Prelim. Resp. 43.

As before, we determine that Petitioner has not demonstrated a reasonable likelihood of success in showing that one of ordinary skill in the art would have had a reasonable expectation of success in using Yoda’s teachings to design a filter for Pilgrim’s application. While Petitioner cites additional requirements from Pilgrim, Petitioner does not explain how one of ordinary skill in the art would have achieved a filter with the passband and blocking level recited in claim 15 in view of the combined teachings of Pilgrim, Yoda, and Wallace. Claims 16 and 17 depend from claim 15 and are argued with reference to claim 15. Pet. 50–51.

Accordingly, upon our review of Petitioner’s contentions, we determine Petitioner fails to make a sufficient showing that the combination of Pilgrim, Yoda, and Wallace would have rendered claims 15–17 obvious.

J. Claims 7 and 19 – Obviousness over Pilgrim, Yoda, Wallace, and Thelen

Claim 7– Obviousness over Pilgrim, Yoda, Thelen, and Gokturk

Petitioner argues that claims 7 and 19 would have been obvious in view of a combination of Pilgrim, Yoda, Wallace, and Thelen, and that claim 7 would have been obvious over a combination of Pilgrim, Yoda, Thelen, and Gokturk. Pet. 52–57. Claim 7 depends from claim 1 and claim 19 depends from claim 15. Petitioner’s showings with respect to these

claims rely in part on the arguments relating to these independent claims, and fail for the same reasons discussed above.

Upon our review of Petitioner's contentions and evidence, we determine Petitioner does not make a sufficient showing that the combination of Pilgrim, Yoda, Wallace, and Thelen would have rendered claims 7 and 19 obvious and that the combination of Pilgrim, Yoda, Thelen, and Gokturk would have rendered claims 7 obvious.

III. CONCLUSION

Petitioner has not shown a reasonable likelihood of prevailing with respect to at least one of the claims challenged in the Petition. Thus, we do not institute an *inter partes* review. *See* 35 U.S.C. § 314(a).

IV. ORDER

In consideration of the foregoing, it is hereby

ORDERED that the Petition is *denied*, and no trial is instituted.

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Patent 11,131,794 B2

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